

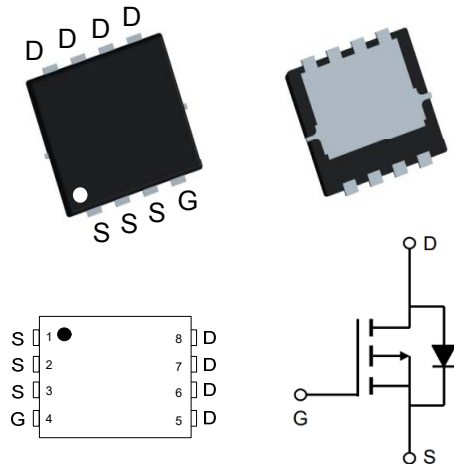
LOW VOLTAGE MOSFET (P-CHANNEL)

FEATURES

- $V_{DS} = -30V, R_{DS(ON)} \leq 10m\Omega$ @ $V_{GS} = -10V, I_D = -10A$
- Ultra Low on-resistance
- For Low power DC to DC converter application
- For Load switch application
- Surface Mount device

MECHANICAL DATA

- Case: PDFN3333
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.012 grams (approximate)
- Marking: Q30P03



PDFN3333

MAXIMUM RATINGS ($T_A = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current ¹	-60	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current ¹	-30	A
I_{DM}	Pulsed Drain Current ²	-90	A
EAS	Single Pulse Avalanche Energy ³	64	mJ
I_{AS}	Avalanche Current	30	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	32	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	-30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS} = 10V, I_D = 10A$		7.4	10	$m\Omega$
		$V_{GS} = 4.5V, I_D = 10A$		11.4	13.5	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu A$	-1.0	-1.6	-2.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS} = 30V, V_{GS} = 0V, T_J = 25^\circ C$	---	---	-1	μA
		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ C$	---	---	-10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$	---	1.8	---	Ω
Q_g	Total Gate Charge (10V)	$V_{DS} = 15V, V_{GS} = 10V, I_D = 20A$	---	81	---	nC
Q_{gs}	Gate-Source Charge		---	12	---	
Q_{gd}	Gate-Drain Charge		---	9.7	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD} = 15V, V_{GS} = 10V, R_G = 3\Omega, I_D = 15A$	---	17	---	ns
T_r	Rise Time		---	21	---	
$T_{d(off)}$	Turn-Off Delay Time		---	36	---	
T_f	Fall Time		---	15	---	
C_{iss}	Input Capacitance	$V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$	---	3980	---	pF
C_{oss}	Output Capacitance		---	450	---	
C_{rss}	Reverse Transfer Capacitance		---	420	---	

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Typical Characteristics

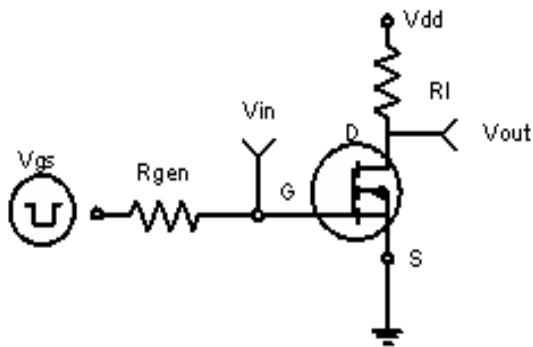


Figure 1 Switching Test Circuit

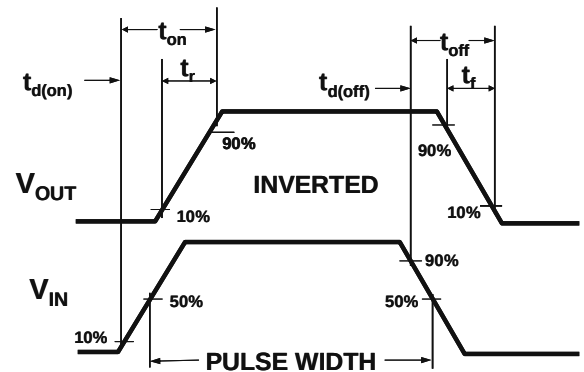


Figure 2 Switching Waveforms

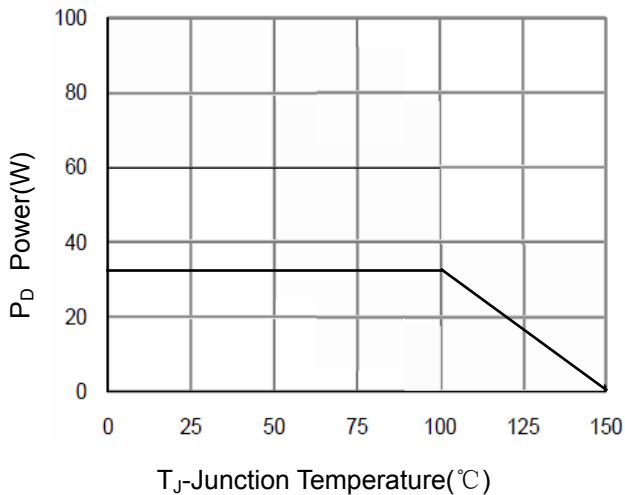


Figure 3 Power Dissipation

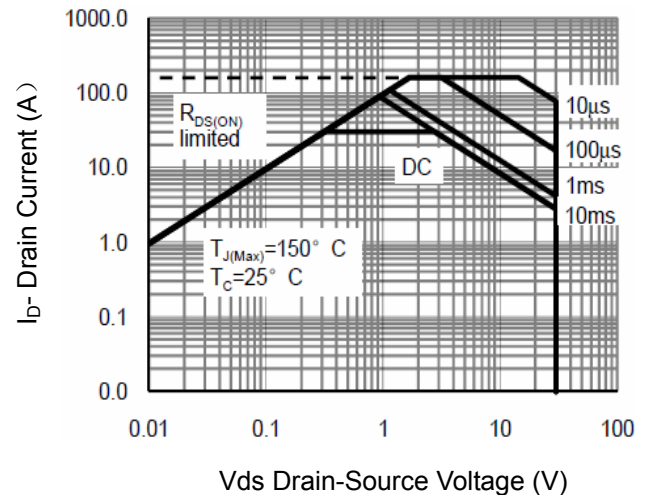


Figure 4 Safe Operation Area

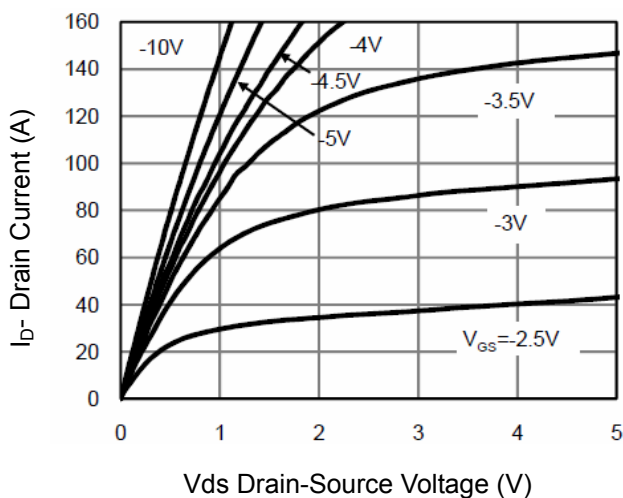


Figure 5 Output Characteristics

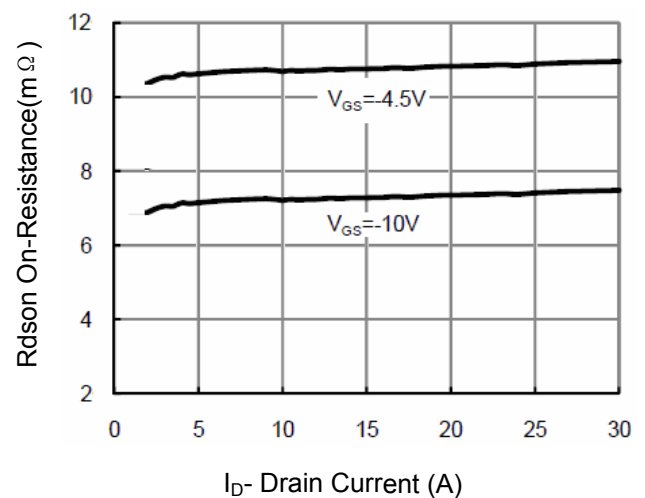


Figure 6 Drain-Source On-Resistance

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Typical Characteristics

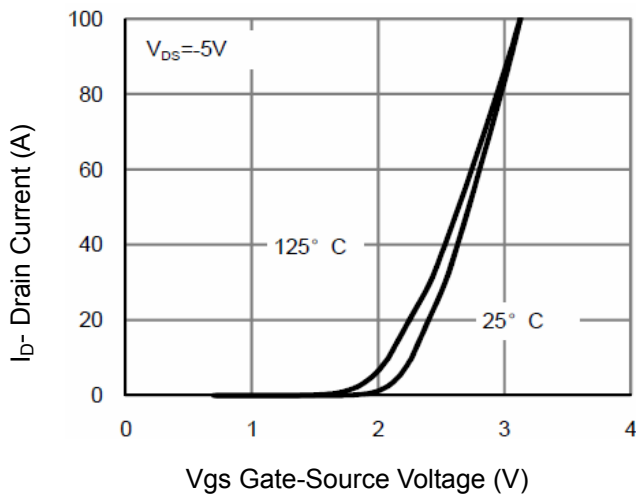


Figure 7 Transfer Characteristics

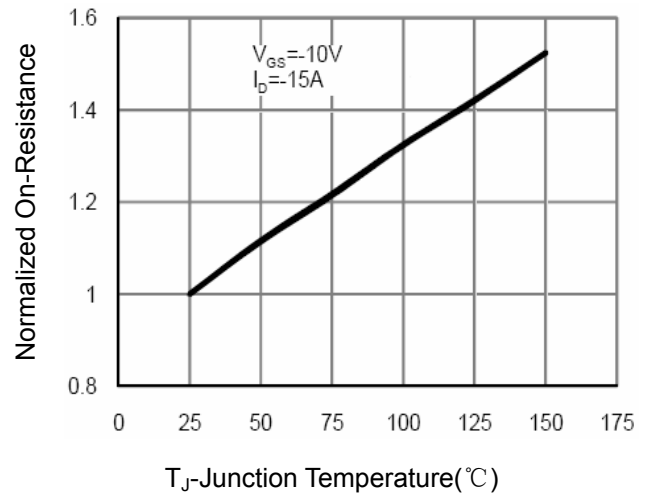


Figure 8 Drain-Source On-Resistance

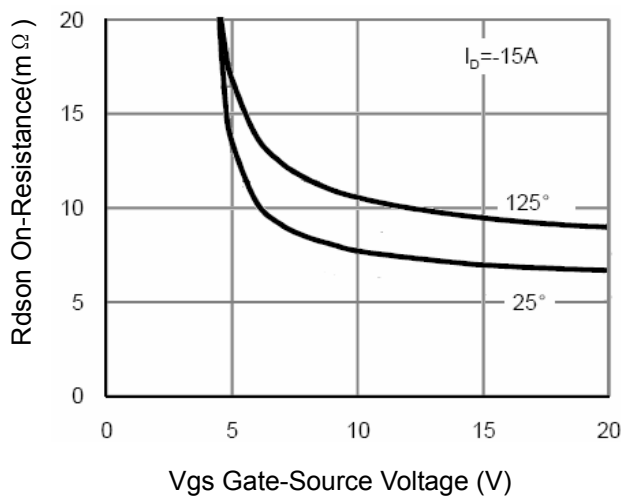


Figure 9 Rdson vs Vgs

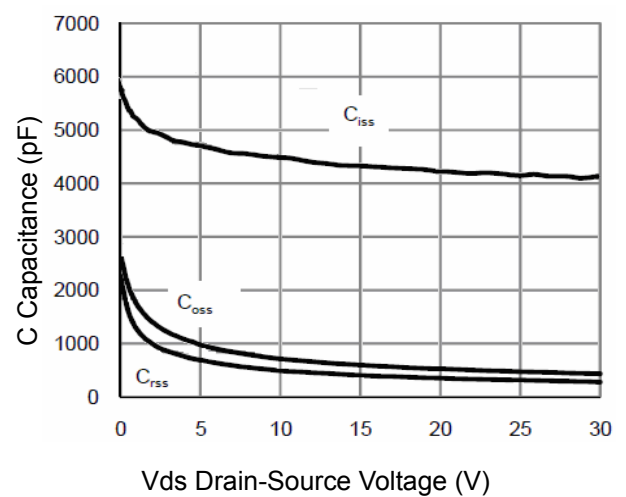


Figure 10 Capacitance vs Vds

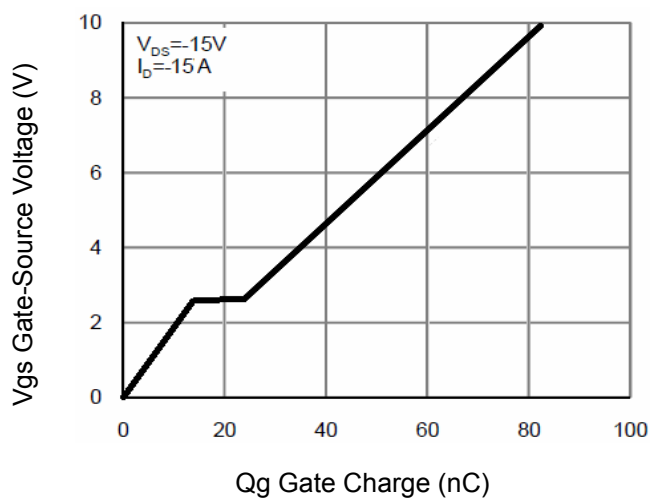


Figure 11 Gate Charge

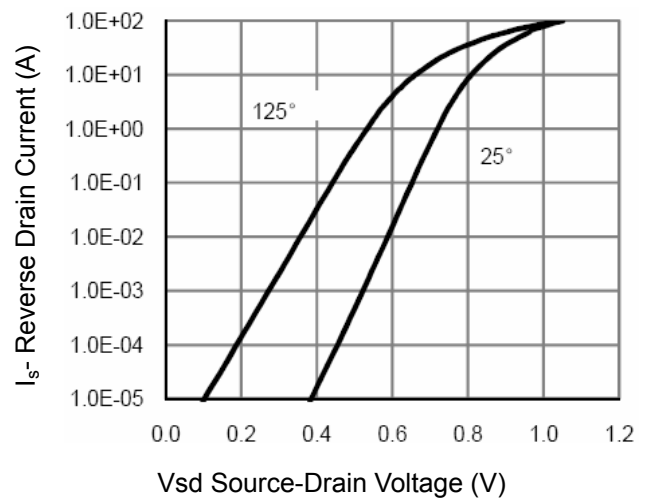
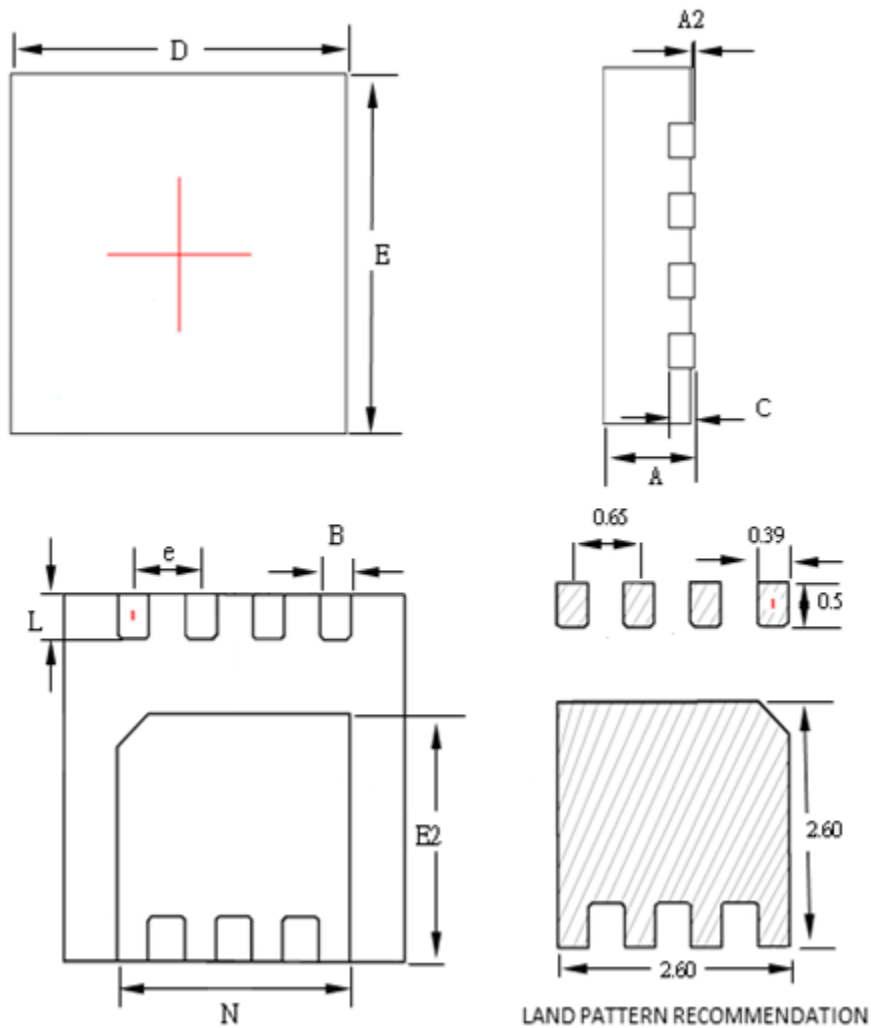


Figure 12 Source- Drain Diode Forward

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PDFN3333



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A2	0.00	--	0.05	0.000	--	0.002
B	0.24	0.30	0.35	0.009	0.012	0.014
C	0.10	0.15	0.25	0.004	0.006	0.010
D	3.15	3.30	3.40	0.124	0.130	0.134
E	3.15	3.30	3.40	0.124	0.130	0.134
E2	2.15	2.25	2.35	0.085	0.089	0.093
L	0.35	0.40	0.45	0.014	0.016	0.018
N	2.10	2.25	2.35	0.083	0.089	0.093
e	--	0.65	--	--	0.026	--